

Exhibit 40

SCHOOL DISTRICT/LOCAL GOVERNMENT ENTITY PLAINTIFFS' OPPOSITION TO DEFENDANTS' MOTION TO EXCLUDE TESTIMONY OF SCHOOL DISTRICT EXPERTS

Case No.: 4:22-md-03047-YGR

MDL No. 3047

In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation

Reply Report of Dr. Bryce Ward

Charleston County School District



Confidential - Subject to Protective Order

July 31, 2025

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I. SUMMARY

A. Executive Summary of Opinions

1. Based on my analysis and review of materials related to this case, I proffer the following opinions at this time within a reasonable degree of certainty based on principles of economic analysis. Should new information become available I reserve the right to revise my analysis, my opinions, or both:

2. In an earlier report (dated May 19, 2025), I provided an estimate for one component of Charleston County School District past compensatory damages — the amount of money Charleston County School District lost while teachers, counselors, and/or administrators addressed issues caused by social media in the school environment.¹ Among other things, Charleston County School District claims it should be reimbursed for teacher, counselor, and administrator time diverted and expended due to student social media use.²

3. To calculate these losses, one needs to estimate the amount of time lost to student social media use and the value of that time.

4. In the Charleston County School District, Mr. Robert Klein provided an estimate of time loss for teachers (based on a survey), and Anita Huggins and Lisa Kathryn Allison provided estimates of time loss for other staff based on their knowledge.³

5. My assignment was to produce an estimate of past losses by calculating the compensation or cost of time for relevant staff in the district and multiplying those amounts by the time loss estimates provided by Mr. Klein, Ms. Huggins, and Ms. Allison.

6. In their replies to my Opening Report, Defendants' experts, Darius Lakdawalla, PhD, and Robert G. Nelson, EdD, level two criticisms of my report.⁴ First, Dr. Lakdawalla and Dr. Nelson claim the time loss estimates provided by Mr. Klein (Lakdawalla only), Ms. Huggins, and Ms. Allison (both Lakdawalla and Nelson) are unreliable. Second, Dr. Lakdawalla claims my report's conception of opportunity costs suffers from purported "conceptual flaws."

7. Dr. Lakdawalla's and Dr. Nelson's critiques of the time loss estimates provided by others are fundamentally not critiques of my cost of time estimates or of the methodology I applied to arrive at my conclusions. My assignment did not include offering opinions on the amount of time lost; rather, my assignment involved providing estimates for the *costs* of time and

¹ Expert Report of Dr. Bryce Ward: Charleston County School District dated May 19, 2025 ("Opening Report").

² See Opening Report, n. 2.

³ Affidavit of Anita Huggins dated May 12, 2025; Affidavit of Lisa Kathryn Allison dated May 15, 2025.

⁴ Expert Report of Darius Lakdawalla, Ph.D. for Charleston County School District, dated July 11, 2025 ("Lakdawalla Report"); Expert Report of Robert Nelson, EdD for Charleston County School District, dated July 11, 2025 ("Nelson Report").

multiplying those amounts by the time loss estimates provided by Mr. Klein, Ms. Huggins, and Ms. Allison.

8. Dr. Lakdawalla’s arguments about the alleged “conceptual flaws” in my use of opportunity cost rely on an inappropriate conception of opportunity cost. As detailed below, the approach advocated by Dr. Lakdawalla is inconsistent with plaintiff’s damage claims and with the literature on measuring the economic costs of education interventions. My approach is well-grounded in this literature. According to various textbook discussions on measuring the cost of education interventions, when a program, policy, or other initiative diverts staff time from its alternative use, it is appropriate to value the opportunity cost of this diverted time using the wages and fringe benefits paid to the relevant staff.⁵ This is precisely my approach.

9. Ultimately, neither Dr. Lakdawalla nor Dr. Nelson offers any critique of the information on staff wages or benefits I analyzed, nor do they critique the economic choices or methods I employed to process these data to determine the value of lost time, which was my primary assignment.

B. Qualifications

10. I am a founder of ABMJ Consulting (ABMJ), which provides economic and statistical analysis for complex litigation. I have also served as a Senior Research Professor, Visiting Assistant Professor or a Visiting Adjunct Professor at the University of Montana, Lewis and Clark College, the University of Oregon, and Portland State University, where I taught courses in microeconomic theory, statistics and econometrics, public economics, labor economics, and environmental economics. I have testified on economic matters in administrative, legislative, and court proceedings, and I have presented papers at professional proceedings on economics. I received a Ph.D. in economics from Harvard University.

C. Information Considered

11. I base my opinions described in this report on my past experience and education as well as on the materials specific to this matter that I reviewed and considered. These materials are detailed in the report text, my Opening Report, and in Appendix A.

II. CRITIQUES OF MR. KLEIN, MS. HUGGINS, AND MS. ALLISON

12. Both Dr. Lakdawalla and Dr. Nelson provide critiques of the time loss estimates provided by Mr. Klein, Ms. Huggins, and Ms. Allison.⁶ Additionally, Dr. Lakdawalla argues that I fail to isolate the effect of at issue conduct and that I assume that but-for at issue conduct school district staff would not have spent any time on tasks related to student social media use.⁷

⁵ See, for instance, Levin, H. M., & McEwan, P. J. (2001). *Cost-effectiveness analysis: Methods and applications* (Second Edition). Sage; Levin, H. M., McEwan, P. J., Belfield, C., Bowden, A. B., & Shand, R. (2017). *Economic evaluation in education: Cost-effectiveness and benefit-cost analysis*. SAGE publications.

⁶ Lakdawalla Report ¶¶ 228-244; Nelson Report ¶¶ 162-164.

⁷ Lakdawalla Report ¶¶ 228, 231, 232, 242.

However, these issues all relate to the estimate for time loss and, as noted in my Opening Report, my assignment did not include providing estimates for (or offering opinions on) time loss.⁸ My assignment involved providing estimates for the value of time and multiplying these time value estimates by the time loss estimates provided by Mr. Klein, Ms. Huggins, and Ms. Allison.

13. Nevertheless, background research I conducted as part of my assignment found that significant proportions of school staff view student social media use as a significant problem in schools.⁹ As such, one should reasonably expect school staff to report spending non-trivial amounts of time addressing social media and its consequences.

14. In one specific critique of Mr. Klein's survey data, Dr. Lakdawalla notes that when a confidence interval includes zero (which only rarely occurs in Mr. Klein's survey data), "one cannot rule out that the observed average share of time diverted is due to random chance and that there is no true time loss."¹⁰ This statement is incomplete. First, Dr. Lakdawalla fails to include the confidence level in his statement. A 95-percent confidence interval requires a high level of confidence to rule out the possibility that the true mean is zero; however, if one lowers the confidence level to 50 percent, one can rule out zero as a possible value for the "true" mean with 50 percent confidence (i.e., it is more likely than not that the true mean is not zero).¹¹ Zero is not within the 50 percent confidence interval for any population included in Mr. Klein's survey. Second, one can also logically rule out zero as a possible value for the true mean because the sample includes positive reported time loss. In any sample drawn from the target population where subjects report positive values, the true mean is strictly greater than zero. Third, because I present a range of values using the conservative 95-percent confidence interval, if zero falls within the confidence interval for some population-year, the lower bound for my range of estimates includes zero losses for that population-year. As such, in these unusual cases, my range of estimates accounts for the unlikely possibility that the actual time loss value is zero.

15. Ultimately, Dr. Lakdawalla's and Dr. Nelson's critiques of the time loss estimates are critiques of factual information provided to me by Mr. Klein, Ms. Huggins, and Ms. Allison. They are not critiques of the information on staff wages or benefits I analyzed, nor are they critiques of the choices or methods I employed to process these data to determine the value of lost time (which was my assignment). I apply my estimates for time value to the estimates for time loss provided by fact witnesses and other experts. Dr. Nelson instead only offers his conclusion that "social media was not a significant problem for the district," and speculates that, if Ms. Huggins and Ms. Allison's estimates were accurate, "school district leadership would have developed and implemented an evidence-based plan and allocated necessary resources to address

⁸ Opening Report ¶ 13.

⁹ Opening Report ¶¶ 23-28. I also note that affidavits I reviewed as part of the 12 reports I submitted on May 19 also confirm that school staff view student social media use as a significant problem in schools. See list in Appendix A.

¹⁰ Lakdawalla Report ¶ 239 n. 316. In the data for CCSD, zero only falls within the 95 percent confidence interval for middle school teachers in 2014.

¹¹ Analysis of Mr. Klein's survey data using same bootstrap technique described in my Opening Report, but with the confidence level changed to 50 percent.

this concern.”¹² Dr. Lakdawalla criticizes Mr. Klein’s survey and similarly questions whether the time loss estimates provided by Ms. Huggins and Ms. Allison are reasonable.¹³ These are critiques of testimony and opinions provided by others, not critiques of my work here.

III. MY APPROACH TO OPPORTUNITY COST DOES NOT SUFFER FROM CONCEPTUAL FLAWS

16. Dr. Lakdawalla also wrongly claims my analysis of “damages to the school district as ‘lost opportunity costs’ also suffers from conceptual flaws.”¹⁴ Specifically, Dr. Lakdawalla claims that I have not analyzed the economic harm suffered by Charleston County School District because I have not analyzed the value of the output produced by precise tasks not done due to social media.¹⁵ However, Dr. Lakdawalla’s conception of opportunity cost is not consistent with the plaintiff’s damage claims, nor is it consistent with textbooks, policy manuals, or academic articles that measure the cost of education policies.

17. As I understand it, Charleston County School District is seeking to recover the cost of diverted resources.¹⁶ It is not seeking to collect damages based on the value of lost output. Thus, the relevant value for calculating damages is the opportunity cost (or value) of the diverted input (i.e., staff wages and benefits) and not the value of foregone output. This is consistent with the use of the term “cost” in educational settings. As noted in Levin et al (2017), “For educational services, the term cost ... refers to the value of all the resources needed to deliver the intervention.”¹⁷

18. Importantly, this approach to costs is the one recommended and used in textbooks, policy manuals, and journal articles that evaluate the cost of education interventions. For instance, textbook discussions of determining the cost of educational interventions use opportunity costs when discussing costs, and they generally value the opportunity cost of staff time using wages and benefits.¹⁸ For instance, Levin and McEwan (2001) note that, “the cost of ... a person is considered to be the monetary value of the salary and fringe benefits.”¹⁹ Similarly, Levin et al (2017) note that if a component of an intervention “requires teachers to reallocate their time from instruction, that time should be counted as an opportunity cost to the school

¹² Nelson Report ¶ 164.

¹³ Lakdawalla Report ¶¶ 228-231, 235-241, 242.

¹⁴ Lakdawalla Report ¶ 243.

¹⁵ Lakdawalla Report ¶ 244.

¹⁶ Opening Report, n. 2.

¹⁷ Levin et al (2017), p. 45.

¹⁸ Levin and McEwan (2001); Levin et al (2017), Lipsey, M. W., Puzio, K., Yun, C., Hebert, M. A., Steinka-Fry, K., Cole, M. W., ... & Busick, M. D. (2012). Translating the Statistical Representation of the Effects of Education Interventions into More Readily Interpretable Forms. *National Center for Special Education Research*.

¹⁹ Levin and McEwan (2001), p. 63.

represented by the teachers' wages and benefits for that time."²⁰ Hollands et al (2020) note that when one conducts a cost analysis of an education program:

“you will need to include opportunity costs of resources that have been reallocated from other purposes or contributed in-kind. This means assigning a value to the resource that represents its worth in its best alternative use. In practice, this means including the costs of personnel time spent on the program regardless of whether this time is already covered by a person's salary...”²¹

At numerous points in their guidelines for performing cost analysis, Hollands et al (2020) note that the cost of teacher or staff time assigned to a program is calculated by multiplying the share of time used by the program by annual salary plus benefits.²² Furthermore, articles that include the costs of educational interventions in their analysis commonly use staff wages and benefits to estimate the relevant personnel costs.²³

19. Using his improper lost output standard, Dr. Lakdawalla also claims that the value of diverted time is low because he doesn't find evidence for worse behavioral or academic outcomes within CCSD.²⁴ Aside from the fact that this is not the appropriate measure to apply, for the reasons explained above, there are numerous other problems with Dr. Lakdawalla's reasoning.

20. For example, schools produce a wide variety of outputs (e.g., cognitive skills, non-cognitive skills) which are linked to improved student (and social) outcomes (e.g., improved performance in the labor market, better health outcomes, reduced crime, higher civic participation, improved parenting (and thus better outcomes among later generations)).²⁵ The

²⁰ Levin et al (2017), p. 69.

²¹ Hollands, F., Pratt-Williams, J., & Shand, R. (2020). Cost Analysis Standards & Guidelines 1.0. Cost Analysis in Practice (CAP) Project, p. 10.

²² Hollands et al (2020), pp. 17, 21.

²³ E.g., Jacob, R., Armstrong, C., Bowden, A. B., & Pan, Y. (2016). Leveraging volunteers: An experimental evaluation of a tutoring program for struggling readers. *Journal of Research on Educational Effectiveness*, 9(sup1), 67-92; Levin, H. M., Belfield, C. R., Hollands, F., Bowden, B., Cheng, H., Shand, R., ... & Hanisch-Cerda, B. (2012). Cost-effectiveness analysis of interventions that improve high school completion; Belfield, C. R., Nores, M., Barnett, S., & Schweinhart, L. (2006). The High/Scope Perry Preschool Program: Cost-benefit analysis using data from the age-40 follow up. *Journal of Human resources*, 41(1), 162-190.

²⁴ Lakdawalla Report ¶ 244.

²⁵ See, for instance, Jackson, C. K. (2018). What do test scores miss? The importance of teacher effects on non-test score outcomes. *Journal of Political Economy*, 126(5), 2072-2107; Jackson, C. K., Porter, S. C., Easton, J. Q., Blanchard, A., & Kiguel, S. (2020). School effects on socioemotional development, school-based arrests, and educational attainment. *American Economic Review: Insights*, 2(4), 491-508; Oreopoulos, P., & Salvanes, K. G. (2011). Priceless: The nonpecuniary benefits of schooling. *Journal of Economic perspectives*, 25(1), 159-184; Oreopoulos, P. (2007). Do dropouts drop out too soon? Wealth, health and happiness from

measures examined by Dr. Lakdawalla are, at best, imperfect proxies for a subset of the ways schools may impact student and social outcomes. Furthermore, even among the types of outcomes he considers, he does not consider every possible measure. For instance, Dr. Lakdawalla's analysis of the National Assessment of Educational Progress (NAEP) only examined reading and math scores; however, NAEP scores in U.S. History declined by a statistically significant amount between 2014 and 2022, civics scores declined by a statistically significant amount between 2018 and 2022, and geography scores declined by a statistically significant amount between 2014 and 2018.²⁶ As such, Dr. Lakdawalla does not demonstrate that social media failed to adversely impact *any* valuable school output.

21. Education is also primarily an investment in long-term outcomes. Several studies of various interventions aimed at improving child outcomes have found small, mixed, or short-lived impacts during the initial years, only for analyses of long-run outcomes to reveal large impacts.²⁷ Dr. Lakdawalla did not conduct such a longitudinal analysis, nor would one be feasible under the schedule in this litigation. Rather, Dr. Lakdawalla isolates certain variables, ignores others, and fails to consider the possibility that social media's impacts will more fully be revealed over time.

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Bryce A. Ward

compulsory schooling. *Journal of public Economics*, 91(11-12), 2213-2229; Oreopoulos, P., Page, M. E., & Stevens, A. H. (2006). The intergenerational effects of compulsory schooling. *Journal of Labor Economics*, 24(4), 729-760; Lochner, L., & Moretti, E. (2004). The effect of education on crime: Evidence from prison inmates, arrests, and self-reports. *American economic review*, 94(1), 155-189; Cutler, D. M., & Lleras-Muney, A. (2010). Understanding differences in health behaviors by education. *Journal of health economics*, 29(1), 1-28; Milligan, K., Moretti, E., & Oreopoulos, P. (2004). Willeck, C., & Mendelberg, T. (2022). Education and political participation. *Annual Review of Political Science*, 25(1), 89-110; Hanushek, E. A., & Woessmann, L. (2008). The role of cognitive skills in economic development. *Journal of economic literature*, 46(3), 607-668; Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. Simon and Schuster.

²⁶ <https://www.nationsreportcard.gov/highlights/ushistory/2022/> [accessed July 25, 2025]; <https://www.nationsreportcard.gov/highlights/civics/2022/> [accessed July 25, 2025]; <https://www.nationsreportcard.gov/highlights/geography/2018/> [accessed July 25, 2025].

²⁷ For instance, Chetty, R., Friedman, J. N., Hilger, N., Saez, E., Schanzenbach, D. W., & Yagan, D. (2011). How does your kindergarten classroom affect your earnings? Evidence from Project STAR. *The Quarterly journal of economics*, 126(4), 1593-1660; Deming, D. (2009). Early childhood intervention and life-cycle skill development: Evidence from Head Start. *American Economic Journal: Applied Economics*, 1(3), 111-134; Chetty, R., Hendren, N., & Katz, L. F. (2016). The effects of exposure to better neighborhoods on children: New evidence from the moving to opportunity experiment. *American Economic Review*, 106(4), 855-902.

APPENDIX A: MATERIALS CONSIDERED

Prior Opening Report dated May 19, 2025 and all documents cited therein, including Appendix B.

Articles and Studies

Belfield, C. R., Nores, M., Barnett, S., & Schweinhart, L. (2006). The High/Scope Perry Preschool Program: Cost–benefit analysis using data from the age-40 followup. <i>Journal of Human resources</i> , 41(1), 162-190.
Federal Judicial Center and National Research Council, Reference Manual on Scientific Evidence, Third Edition, (Washington, D.C.: The National Academies Press, 2011)
Hollands, F., Pratt-Williams, J., & Shand, R. (2020). Cost Analysis Standards & Guidelines 1.0. Cost Analysis in Practice (CAP) Project.
Jacob, R., Armstrong, C., Bowden, A. B., & Pan, Y. (2016). Leveraging volunteers: An experimental evaluation of a tutoring program for struggling readers. <i>Journal of Research on Educational Effectiveness</i> , 9(sup1), 67-92
Levin, H. M., Belfield, C. R., Hollands, F., Bowden, B., Cheng, H., Shand, R., ... & Hanisch-Cerda, B. (2012). Cost-effectiveness analysis of interventions that improve high school completion
Levin et al (2017), Lipsey, M. W., Puzio, K., Yun, C., Hebert, M. A., Steinka-Fry, K., Cole, M. W., ... & Busick, M. D. (2012). Translating the Statistical Representation of the Effects of Education Interventions into More Readily Interpretable Forms. National Center for Special Education Research
Levin, H. M., McEwan, P. J., Belfield, C., Bowden, A. B., & Shand, R. (2017). Economic evaluation in education: Cost-effectiveness and benefit-cost analysis. SAGE publications.
Levin, H. M., & McEwan, P. J. (2001). Cost-effectiveness analysis: Methods and applications (Second Edition). Sage
Chetty, R., Friedman, J. N., Hilger, N., Saez, E., Schanzenbach, D. W., & Yagan, D. (2011). How does your kindergarten classroom affect your earnings? Evidence from Project STAR. <i>The Quarterly journal of economics</i> , 126(4), 1593-1660.
Chetty, R., Hendren, N., & Katz, L. F. (2016). The effects of exposure to better neighborhoods on children: New evidence from the moving to opportunity experiment. <i>American Economic Review</i> , 106(4), 855-902.
Deming, D. (2009). Early childhood intervention and life-cycle skill development: Evidence from Head Start. <i>American Economic Journal: Applied Economics</i> , 1(3), 111-134.
Cutler, D. M., & Lleras-Muney, A. (2010). Understanding differences in health behaviors by education. <i>Journal of health economics</i> , 29(1), 1-28.
Hanushek, E. A., & Woessmann, L. (2008). The role of cognitive skills in economic development. <i>Journal of economic literature</i> , 46(3), 607-668.
Jackson, C. K. (2018). What do test scores miss? The importance of teacher effects on non–test score outcomes. <i>Journal of Political Economy</i> , 126(5), 2072-2107.

Jackson, C. K., Porter, S. C., Easton, J. Q., Blanchard, A., & Kiguel, S. (2020). School effects on socioemotional development, school-based arrests, and educational attainment. <i>American Economic Review: Insights</i> , 2(4), 491-508.
Lochner, L., & Moretti, E. (2004). The effect of education on crime: Evidence from prison inmates, arrests, and self-reports. <i>American economic review</i> , 94(1), 155-189.
Oreopoulos, P., & Salvanes, K. G. (2011). Priceless: The nonpecuniary benefits of schooling. <i>Journal of Economic perspectives</i> , 25(1), 159-184.
Oreopoulos, P. (2007). Do dropouts drop out too soon? Wealth, health and happiness from compulsory schooling. <i>Journal of public Economics</i> , 91(11-12), 2213-2229.
Oreopoulos, P., Page, M. E., & Stevens, A. H. (2006). The intergenerational effects of compulsory schooling. <i>Journal of Labor Economics</i> , 24(4), 729-760.
Putnam, R. D. (2000). <i>Bowling alone: The collapse and revival of American community</i> . Simon and Schuster.
Willeck, C., & Mendelberg, T. (2022). Education and political participation. <i>Annual Review of Political Science</i> , 25(1), 89-110.
U.S. History score continues decline begun in 2014. https://www.nationsreportcard.gov/highlights/ushistory/2022/ [accessed July 25, 2025]
Civics score declines for the first time; score unchanged compared to 1998. https://www.nationsreportcard.gov/highlights/civics/2022/ [accessed July 25, 2025];
See How Eighth-Grade Students Performed in Geography. https://www.nationsreportcard.gov/highlights/geography/2018/ [accessed July 25, 2025]

Litigation Documents

Expert Report of Dr. Bryce Ward: Charleston County School District dated May 19, 2025, and all documents cited therein.
Expert Report of Robert Klein for Charleston County School District, dated May 18, 2025
Expert Report of Robert G. Nelson, EdD for Charleston County School District, dated July 11, 2025
Expert Report of Darius Lakdawalla, Ph.D. for Charleston County School District, dated July 11, 2025
Deposition of Lisa K. Allen, dated June 20, 2025

Affidavits

Breathitt	William Noble Affidavit
	Daphne Noble Affidavit
	Phillip Watts Affidavit
	Kera Howard Affidavit
	Jeremy Hall Affidavit
Charleston	Anita Huggins Affidavit
	Lisa Katherine Allison Affidavit
Chatham	Objections and Responses to ROG 3
Harford	Bernard Hennigan Deposition Testimony

	Sean Bulson Deposition Testimony
	Donoven Brooks Deposition Testimony
Hillsborough	Myrna Hogue Affidavit
	Jaime Gerding Affidavit
	Gary Brady Affidavit
Irvington	April Vauss Affidavit
	Sandra Lopez Affidavit
Jordan	Stacee Worthen Affidavit
	Brad Sorenson Affidavit
	McKinley Withers Affidavit
	Fulvia Franco Affidavit
Saint Charles	Jason Madere Affidavit
	Sean Dwyer Affidavit
Spartanburg	Alan C. Eggert Deposition Testimony
	Funderburk 30(b)(6) Deposition Testimony
Tucson	Brian Lambert Affidavit
	Holly Hammel Affidavit
	Sabrina Salmon Affidavit
	Julie Shivanonda Affidavit